# HABITAT TYPES OF THE KIMSQUIT RIVER ESTUARY

by

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## INTRODUCTION

In August 1983, a vegetation survey, funded by the Fish and Wildlife Branch, Ministry of Environment, was implemented on the Kimsquit River estuary. In addition, substrates were described and sampled by a surficial geologist, provided by the Surveys and Mapping Branch, Ministry of Environment. This work and accompanying map and report are a component of the coastal grizzly project, a cooperative project involving the Ministries of Environment and Forests (Archibald 1981; Archibald and Hamilton 1982; Hamilton 1983).

The objectives of this survey were:

1. to define and describe estuarine habitat types; and,

2. to map (at 1:2500) estuarine habitat types.

These objectives were accomplished by conducting a standard estuarine habitat inventory (Hunter et al. 1983). Data covering all habitat types (vegetation and/or substrate texture) were collected and analyzed. Raw data are available from the Wildlife Branch, Ministry of Environment, Victoria, B.C.

In this report, habitat types of the Kimsquit River estuary are described. For graphic representation of these habitat types, see Kimsquit Estuarine Habitat Inventory - 1:2500 map (Clement 1984). The study area is illustrated in Figure 1. A more detailed description of the study area is presented by Hamilton (1983). A number of maps and reports are available describing the vegetation and soils of the Kimsquit River drainage (Yole et al. 1982; Banner 1984; Clement 1984).

The author wishes to thank R. Hunter, for help in designing the project and map production. Thanks also to T. Vold for providing able field assistance and to T. Hamilton for showing me the intricacies of an inflatable boat.

## METHODS

The vegetation and soil inventory was conducted following standard sampling techniques described in Walmsley et al. (1980) and Hunter et al. (1983). For vegetated sites, vegetation and soils data were recorded on computer-compatible data sheets produced by the Ministries of Environment and Forests. At other locations, brief notes on substrate texture were taken.

Figure 1. LOCATION OF STUDY AREA

Access to the east side of the estuary was provided by an inflatable boat and by walking. The western part of the estuary was reached by walking off the landing strip and the dry land sort (see Figure 1).

Substrate descriptions were made at 48 locations, and, at 26 of these sites (plots), detailed soil and vegetation descriptions were made. At each plot location, a list of vascular and non-vascular (mosses) plants was made. Voucher specimens of most vascular plants were collected (50 plant species were collected and are on file with R. Archibald, Wildlife Branch, Ministry of Environment, Victoria) and were verified by Dr. R. Ogilvie, Dr. A. Ceska, and Dr. T. Brayshaw (Provincial Museum, Victoria). Percent cover (ocular estimate), distribution, and vigour were recorded for each plant species at each plot location. Where vegetation data were recorded, detailed descriptions of soil horizons, texture, coarse fragments, colour, mottles, roots, and pH were noted. In addition, at 33 sites, soil samples (42 in total) were taken and analyzed for salt content, electrical conductivity, and carbon/nitrogen ratio. Analysis of results are available from T. Vold (Surveys and Resource Mapping Branch, Ministry of Environment, Victoria). Water samples to determine salinity were taken at three locations. Biomass samples of grizzly bear food plants (roots) were taken at four locations.

The entire estuary is within the CWHh3 variant (Banner 1984) with no typical climax vegetation present. Thirteen habitat types were recognized and described ( including the land fill area on the west side of the estuary). Descriptions of the habitat types are presented in the next section with detailed vegetation tables provided in Appendix A. Also given in the Appendices are a Plant Species List (Appendix B) and Definition of Habitat Types (Appendix C).

## DESCRIPTION OF HABITAT TYPES

### INTRODUCTION

Habitat types are based on tidal zonation and biophysical habitat components (see Appendix C for definitions) modified by appropriate substrate, vegetation, salinity, and anthropogenic descriptors (Hunter et al. 1983). A habitat type can be described as a recurring unit of land having similar characteristics of tidal influence, vegetation, substrate, salinity, and/or anthropogenic disturbance.

The habitat types are described here in terms of tidal zonation, relative estuarine location, substrate texture, and characteristic plant species (where relevant). The areal distribution of types is presented in Table 1.

INTERTIDAL BAR

These are intertidal sandbars which have been formed and controlled by fluvial processes. The size and location (in the main channel of the Kimsquit River) of these bars may change according to streamflow characteristics. Vascular plants are absent and substrates are generally sand and cobbles.

Table 1. Areal compilation of habitat types.

| Habitat Type | Area (ha) | Percent |
|---|---|---|
| Intertidal bar | 4.61 | 7.47 |
| Intertidal beach face | 1.44 | 2.33 |
| Intertidal river channel | 8.51 | 13.80 |
| Intertidal tide channel | 4.62 | 7.49 |
| Intertidal flat | 20.32 | 32.94 |
| Intertidal high marsh | 2.76 | 4.47 |
| Intertidal low marsh | 9.08 | 14.72 |
| Backshore bar | .87 | 1.42 |
| Backshore river channel | 1.99 | 3.23 |
| Backshore side channel | .64 | 1.04 |
| Backshore coniferous forest, Backshore deciduous forest | .44 | .72 |
| Backshore high shrub carr, Backshore low shrub carr | 4.53 | 7.34 |
| Backshore landfill | 1.87 | 3.03 |
| TOTAL | 61.68 | 100.00 |

INTERTIDAL BEACH FACE

Beach faces are characterized by extensive log debris accumulation and areas of exposed sand. These areas mark the interface between intertidal and backshore areas and have a sandy textured substrate. Patches of vascular plants occur, dominated by Juncus spp. (rushes), Potentilla anserina subsp. pacifica (Pacific silverweed), Mimulus guttatus (common monkeyflower), and Salix sitchensis (Sitka willow). Also significant are Ranunculus cymbalaria (shore buttercup), Plantago major (greater plantain), Agrostis exarta (spike bent grass), Trifolium wormskioldii (springbank clover), Anagallis minima (chaffweed), Sagina procumbens (birdseye pearlwort), and the seaweed Enteromorpha sp.

INTERTIDAL RIVER CHANNEL

This habitat type is the main Kimsquit River channel, with a tidal influence. The substrate is sandy and cobbly.

INTERTIDAL TIDE CHANNEL

Tide channels drain both sides of the estuary. On the east side, a large channel joins to a backshore side channel with a small fresh water flow. The substrate varies from silty sandy gravelly to sandy cobbly.

INTERTIDAL FLAT

Extensive tidal flats, located adjacent to the lower portion of the main river channel, are divided into two units based on substrate texture. Flats with a sandy gravelly cobbly substrate are exposed at most low tides, while flats with a silty, sandy texture are only exposed at lowest low tides.

INTERTIDAL HIGH MARSH

High marsh habitats are found on silty sandy substrates between backshore shrub and low marsh areas. Dominant plants include Carex lyngbyei (Lyngbye's sedge), Deschampsia cespitosa (tufted hair grass), Potentilla anserina subsp. pacifica, Plantago macrocarpa (Alaska plantain), and Juncus articus (Arctic rush). Other characteristic plants, with lesser cover, are Aster subspicatus var. subspicatus (Douglas aster), Triglochin maritimum (sea-side arrow-grass), Ranunculus orthorhyncus (straight-beaked buttercup), Cicuta douglasii (Douglas water-hemlock), and Trifolium wormskioldii.

INTERTIDAL LOW MARSH

Occurring adjacent to tidal flats and channels on silty substrates, the low marsh habitat type is dominated by Carex lyngbei. Occasionally found with a very low coverage are Deschampsia cespitosa, Callitriche heterophylla (diverse-leaved water starwort), Eleocharis palustris (creeping spike-rush), and Sium suave (hemlock water-parsnip).

BACKSHORE BAR

This type consists of sandbars, in the main Kimsquit River channel, formed and controlled by fluvial processes which are above tidal influence. Where bars are relatively stable, patches of plants have established. Commonly occurring, with low cover, are Salix sitchensis, Rubus spectabilis (salmonberry), Aster subspicatus var. subspicatus, Achillea millefolium (yarrow), Elymus glaucus (blue wild rye grass), and Agrostis exarata.

BACKSHORE RIVER CHANNEL

This is the area defined by the main Kimsquit River channel, above tidal influence, with a sandy cobbly substrate.

## BACKSHORE SIDE CHANNEL

This habitat type, with a sandy cobbly substrate, is confined to a small channel of the Kimsquit River flowing on the east side of the estuary.

## BACKSHORE FOREST

### Coniferous Forest

A small area of coniferous forest occurs on a raised silty sandy area surrounded by shrub carr. Picea sitchensis (Sitka spruce) is the only tree present. The sparse shrub layer is composed of Lonicera involucrata (twinberry honeysuckle) and Malus fusca (Pacific crab apple). Dominant herbs are Elymus glaucus, Maianthemum dilatatum (two-flowered false Solomons-seal), Prenanthes elata (western rattlesnakeroot), Athyrium filix-femina subsp. cyclosorum (common lady fern), and Trautvetteria caroliniensis (false bugbane). The moss layer is composed of Rhytidiadelphus squarrosus and Rhytidiadelphus loreus.

### Deciduous Forest

The deciduous forest occurs at the northern tip of the estuary, on a sandy gravelly substrate. Populus balsamifera subsp. trichocarpa (black cottonwood) and Alnus rubra (red alder) dominate the tree and shrub layers. Also common in the shrub layer are Malus fusca, Picea sitchensis. Lonicera involucrata, and Rubus spectabilis. The sparse herb layer is dominated by Maianthemum dilatatum.

## BACKSHORE SHRUB CARR

### High Shrub Carr

The high shrub carr is found on silty substrates above tidal influence. Dominant shrubs are Salix sitchensis, Malus fusca, and Lonicera involucrata. Commonly occurring herbs are Trautvetteria caroliniensis, Maianthemum dilatatum, Angelica genuflexa (kneeling angelica), and Heracleum sphondylium subsp. montanum (common cow-parsnip).

### Low Shrub Carr

The low shrub carr habitat type occurs between high shrub carr, backshore beach face, and intertidal high marsh on sandy substrates. The shrub layer is dominated by Salix sitchensis and Myrica gale. Dominant herbs are Aster subspicatus var. subspicatus, Maianthemum dilatatum, Potentilla anserina subsp. pacifica, Oenanthe sarmentosa (Pacific oenanthe), and Angelica genuflexa.

BACKSHORE LANDFILL

This area of landfill is on the west side of the estuary and is used for log handling.

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APPENDIX A. Habitat type tables.

The habitat type tables are a summary of the vegetation data collected on sites during field work. Plant species are listed in layers (trees and shrubs, herbs, mosses) and are ordered by dominance in each type. Plant species names are given in standard Latin code format (the first four letters of the genus name and the first three letters of the species name; e.g. Salix sitchensis (Sitka willow) is represented as SALI SIT). If only the genus name is used, the code becomes the first seven letters of the genus, or less if the genus name is less than seven letters. Numbers listed under plot numbers are percent cover estimates for each plant species. MC stands for mean cover; numbers in this column are the mean percent cover values (MC = total percent cover divided by number of plots). For common names, refer to Appendix B.

INTERTIDAL BEACH FRONT

| Plant Species | Plot No. 32 | Plot No. 37 | MC |
|---|---|---|---|
| SHRUBS | | | |
| SALI SIT | 5 | 2 | 3.5 |
| HERBS | | | |
| JUNCUS | 20 | 30 | 25.0 |
| POTE PAC | 5 | 5 | 5.0 |
| CARE LYN | 1 | 10 | 5.5 |
| ASTE SUB | 1 | 5 | 3.0 |
| TRIF WOR | 2 | 2 | 2.0 |
| MIMU GUT | 3 | 1 | 2.0 |
| CAST HIS | 1 | 2 | 1.5 |
| DESC CES | 1 | 2 | 1.5 |
| PRUN VUL | 1 | 1 | 1.0 |
| PLAN MAR | | 5 | 2.5 |
| PLAN MAJ | 2 | | 1.0 |
| RANU CYM | 2 | | 1.0 |
| AGRO EXA | 2 | | 1.0 |
| SAGI PRO | 2 | | 1.0 |
| ANAG MIN | 2 | | 1.0 |
| LATH JAP | | 2 | 1.0 |
| FEST RUB | | 2 | 1.0 |
| SIUM SUA | 1 | | 0.5 |
| CICU DOU | 1 | | 0.5 |
| CRAS AQU | 1 | | 0.5 |
| ACHI MIL | | 1 | 0.5 |
| LIMO AQU | 1 | | 0.5 |
| NON-VASCULAR | | | |
| ENTEROM | | 10 | 5.0 |

*INTERTIDAL HIGH MARSH*

| Plant Species | Plot No. | | | | | MC |
|---|---|---|---|---|---|---|
| | 04 | 06 | 10 | 27 | 28 | |
| HERBS | | | | | | |
| JUNC ARC | 40 | 60 | 5 | 3 | 40 | 30.0 |
| PLAN MAC | 20 | 15 | 15 | 15 | 15 | 16 |
| CARE LYN | 10 | 7 | 15 | 15 | 10 | 11 |
| DESC CES | 10 | 5 | 10 | 15 | 10 | 10 |
| POTE PAC | 10 | 20 | 20 | 1 | 5 | 7 |
| CICU DOU | 2 | 1 | 1 | 10 | 2 | 3 |
| ASTE SUB | 15 | 1 | | 1 | 15 | 8 |
| TRIG MAR | 2 | 3 | 20 | | 1 | 5 |
| TRIF WOR | 1 | 1 | | 5 | 10 | 5 |
| RANU ORT | 5 | 0.5 | | 1 | 5 | 2 |
| SIUM SUA | | 2 | 10 | 5 | | 2 |
| GALI TRI | | 5 | 3 | | 1 | 2 |
| CAST HIS | 3 | 2 | | | 1 | 1 |
| CONI PAC | 1 | | | 1 | 1 | 0.5 |
| ELEO PAL | | | 10 | 40 | | 10 |
| OENA SAR | | 2 | 5 | | | 1.5 |
| RANU CYM | | 0.5 | 5 | | | 1 |
| LUPI LIT | 2 | | | | 2 | 1 |
| PRUN VUL | 5 | | | | | 1 |
| VIOLA | | | | | 5 | 1 |
| VICI AME | | 2 | | | | 0.5 |
| FEST RUB | | | | | 1 | 0.5 |

INTERTIDAL LOW MARSH

| Plant Species | Plot No. | | | | | | | MC |
|---|---|---|---|---|---|---|---|---|
| | 01 | 02 | 03 | 05 | 25 | 26 | 45 | |
| HERBS | | | | | | | | |
| CARE LYN | 75 | 60 | 60 | 75 | 80 | 80 | 70 | 70 |
| ELEO PAL | 3 | | | | 3 | | | 1 |
| SIUM SUA | 1 | | | | | | | 0.5 |
| DESC CES | | | | | 1 | | | 0.5 |
| CALL HET | | | | | | | 0.5 | 0.5 |

BACKSHORE BAR

| Plant Species | Plot No. 46 | Plot No. 47 | MC |
|---|---|---|---|
| **SHRUBS** | | | |
| SALI SIT | 5 | 20 | 12 |
| RUBU SPE | 0.5 | 3 | 2 |
| ALNU RUB | | 3 | 1.5 |
| POPU TRI | | 3 | 1.5 |
| LONI INV | | 1 | 0.5 |
| **HERBS** | | | |
| MIMU GUT | 5 | 2 | 3.5 |
| ELYM GLA | 1 | 5 | 3 |
| ACHI MIL | 2 | 3 | 2.5 |
| ASTE SUB | 2 | 3 | 1.5 |
| EPIL CIL | 1 | 2 | 1.5 |
| AGRO EXA | 1 | 1 | 1 |
| AQUI ARV | 3 | | 1.5 |
| POTE PAC | 2 | | 1 |
| JUNC ENS | 1 | | 0.5 |
| ELYM MOL | 1 | | 0.5 |
| LUPI LIT | 1 | | 0.5 |
| MIMU LEW | 1 | | 0.5 |
| TRAU CAR | | 2 | 1 |
| PRUN VUL | | 1 | 0.5 |
| EPIL ANG | | 1 | 0.5 |
| PLAN MAJ | | 1 | 0.5 |
| MAIA DIL | | 0.5 | 0.5 |
| VIOLA | | 0.5 | 0.5 |

BACKSHORE CONIFEROUS FOREST

| Plant Species | Plot No. 11 | Plot No. 12 | MC |
|---|---|---|---|
| **TREES AND SHRUBS** | | | |
| PICE SIT | 40 | 35 | 37 |
| MALU FUS | 5 | 5 | 5 |
| LONI INV | 5 | 5 | 5 |
| **HERBS** | | | |
| ELYM GLA | 20 | 35 | 27 |
| MAIA DIL | 15 | 25 | 20 |
| PREN ALA | 15 | 5 | 10 |
| HERA SPH | 3 | 15 | 9 |
| ATHY FIL | 10 | 2 | 6 |
| TRAU CAR | 5 | 5 | 5 |

BACKSHORE CONIFEROUS FOREST, continued

| Plant Species | Plot No. 11 | Plot No. 12 | MC |
|---|---|---|---|
| HERBS, continued | | | |
| SANGUIS | 5 | 2 | 3.5 |
| ANGE GEN | 3 | 1 | 2 |
| GALI TRI | 2 | 1 | 1.5 |
| TRIS CER | 2 | 1 | 1.5 |
| FRIT CAM | 1 | 1 | 1 |
| OENA SAR | 5 | | 2.5 |
| STRE AMP | | 2 | 1 |
| PLAN MAJ | | 2 | 1 |
| EQUI ARV | | 1 | 0.5 |
| MOSSES | | | |
| RHYT SQU | 40 | 50 | 45 |
| RHYT LOR | 20 | 10 | 15 |

BACKSHORE DECIDUOUS FOREST

| Plant Species | Plot No. 15 |
|---|---|
| TREES AND SHRUBS | |
| MALU FUS | 35 |
| RUBU SPE | 25 |
| POPU TRI | 20 |
| LONI INV | 20 |
| PICE SIT | 10 |
| ALNU RUB | 10 |
| HERBS | |
| MAIA DIL | 25 |
| ANGE GEN | 3 |
| CALAMAG | 2 |
| TRAU CAR | 2 |
| OENA SAR | 2 |
| ATHY FIL | 1 |

BACKSHORE HIGH SHRUB CARR

| Plant Species | Plot No. | | | MC |
|---|---|---|---|---|
| | 13 | 14 | 48 | |
| **SHRUBS** | | | | |
| MALU FUS | 15 | 10 | 60 | 28 |
| SALI SIT | 35 | 30 | 5 | 23 |
| LONI INV | 50 | 10 | 5 | 22 |
| PICE SIT | 10 | | | 3 |
| ROSA | | | 10 | 3 |
| MYRI GAL | 5 | | | 2 |
| **HERBS** | | | | |
| ANGE GEN | 2 | 20 | 10 | 10 |
| TRAU CAR | 10 | 5 | 10 | 8 |
| MAIA DIL | 5 | 7 | 10 | 7 |
| HERA SPH | 5 | 5 | 5 | 5 |
| SANGUIS | 2 | 25 | | 9 |
| OENA SAR | 2 | 5 | | 2 |
| CALAMAG | 5 | 2 | | 2 |
| STRE AMP | 2 | | 1 | 1 |
| PREN ALA | | 5 | | 2 |
| CARE GME | | 5 | | 1 |
| ASTE SUB | | 3 | | 1 |
| EQUI ARV | 1 | | | 0.5 |
| ELYM GLA | | | 1 | 0.5 |

BACKSHORE LOW SHRUB CARR

| Plant Species | Plot No. | | | | | MC |
|---|---|---|---|---|---|---|
| | 07 | 08 | 09 | 29 | 30 | |
| **SHRUBS** | | | | | | |
| SALI SIT | 20 | 40 | 30 | 40 | 40 | 34 |
| MYRI GAL | 40 | 30 | 10 | 2 | | 16 |
| SALI LAS | | | | 2 | 5 | 1.5 |
| POPU TRI | | | | | 20 | 4 |
| PICE SIT | | | 10 | | | 2 |
| LONI INV | 3 | | | | | 0.5 |
| **HERBS** | | | | | | |
| MAIA DIL | 5 | 10 | 3 | 20 | 5 | 9 |
| OENA SAR | 25 | 10 | 15 | 2 | 1 | 6 |
| ASTE SUB | 3 | 0.5 | 5 | 15 | 3 | 5 |
| POTE PAC | 10 | 5 | 10 | 5 | | 6 |
| ANGE GEN | 5 | 5 | 5 | | 10 | 5 |
| CALAMAG | 2 | 10 | 5 | | 1 | 3.5 |
| CARE LYN | 1 | 2 | 5 | 2 | | 2 |

BACKSHORE LOW SHRUB CARR, continued

| Plant Species | Plot No. | | | | | MC |
|---|---|---|---|---|---|---|
| | 07 | 08 | 09 | 29 | 30 | |
| HERBS, continued | | | | | | |
| SANGUIS | 20 | | 5 | 10 | | 7 |
| EQUI ARV | 10 | | | 1 | 1 | 2.5 |
| PRUN VUL | | | | 5 | 5 | 2 |
| PLAN MAJ | | | 1 | | 1 | 0.5 |
| RUME OCC | | 1 | 1 | | | 0.5 |
| DESC CES | | | | 1 | 1 | 0.5 |
| TRAU CAR | | | | | 3 | 1 |
| TRIF WOR | | | | 2 | | 0.5 |
| SONC ARV | 2 | | | | | 0.5 |
| HERA SPH | | 2 | | | | 0.5 |
| VICI AME | 1 | | | | | 0.5 |
| CAST HIS | | | | 1 | | 0.5 |
| RANU ORT | | | | 1 | | 0.5 |
| FEST RUB | | | | 1 | | 0.5 |

APPENDIX B. Plant Species List

The plant species list includes all vascular plants and bryophytes encountered during the course of field sampling. Nomenclature for vascular plants is after Taylor and MacBryde (1977).

| Latin Names | Common Names |
|---|---|
| TREES | |
| Alnus rubra | red alder |
| Picea sitchensis | Sitka spruce |
| Populus balsamifera subsp. trichocarpa | black cottonwood |
| SHRUBS | |
| Lonicera involucrata | twinberry honeysuckle |
| Malus fusca | Pacific crab apple |
| Myrica gale | sweet gale |
| Rosa sp. | rose |
| Rubus spectabilis | salmonberry |
| Salix lasiandra | Pacific willow |
| Salix sitchensis | Sitka willow |
| HERBS AND DWARF SHRUBS | |
| Achillea millefolium | yarrow |
| Agrostis exarta | spike bent grass |
| Anagallis minima | chaffweed |
| Angelica genuflexa | kneeling angelica |
| Aster subspicatus var. subspicatus | Douglas aster |
| Athyrium filix-femina subsp. cyclosorum | common lady-fern |
| Barbarea orthceras | American winter cress |
| Bidens cernua | nodding beggarticks |
| Calamagrostis sp. | small reed grass |
| Callitriche heterophylla | diverse-leaved water starwort |
| Carex gmelinii | Gmelin's sedge |
| Carex lyngbyei | Lyngbye's sedge |
| Castilleja hispida | harsh Indian paintbrush |
| Cicuta douglasii | Douglas' water-hemlock |
| Conioselinum pacificum | Pacific hemlock parsley |
| Crassula aquatica | pigmyweed |
| Deschampsia cespitosa | tufted hair grass |
| Eleocharis palustris | creeping spike-rush |
| Elymus glaucus | blue wild rye grass |
| Elymus mollis var. mollis | dune wild rye grass |
| Epilobium angustifolium | fireweed |
| Epilobium ciliatum | purple-leaved willowherb |
| Epilobium latifolium subsp. latifolium | broad-leaved willowherb |
| Equisetum arvense | common horsetail |
| Festuca rubra | red fescue |
| Fritillaria camschatcensis subsp. camschatcensis | riceroot fritillary |

APPENDIX B, continued

| Latin Name | Common Name |
|---|---|
| Galium trifidum subsp. pacificum | coastal small bedstraw |
| Heracleum sphondylium subsp. montanum | common cow-parsnip |
| Juncus alpinoarticulatus | alpine rush |
| Juncus articus | Arctic rush |
| Juncus ensifolius | sword-leaved rush |
| Lathyrus japonicus var. glaber | beach pea |
| Limosella aquatica | water mudwort |
| Lupinus littoralis | chinook lupine |
| Maianthemum dilatum | two-leaved false Solomon's-seal |
| Mentha arvensis subsp. borealis | field mint |
| Mimulus guttatus | common monkeyflower |
| Mimulus lewisii | Lewis' monkeyflower |
| Oenanthe sarmentosa | Pacific oenanthe |
| Plantago macrocarpa | Alaska plantain |
| Plantago major | greater plantain |
| Plantago maritima | sea plantain |
| Potentilla anserina subsp. pacifica | Pacific silverweed |
| Prenanthes alata | western rattlesnakeroot |
| Prunella vulgaris | common self-heal |
| Ranunculus cymbalaria | shore buttercup |
| Ranunculus orthorhyncus | straight-beaked buttercup |
| Rumex occidentalis | western dock |
| Sagina procumbens | bird's-eye pearlwort |
| Sanguisorba sp. | burnet |
| Sium suave | hemlock water-parsnip |
| Sonchus arvensis | perennial sow-thistle |
| Streptopus amplexifolius | cucumberroot twistedstalk |
| Trautvetteria carolinienais | false bugbane |
| Trifolium wormskjoldii | springbank clover |
| Triglochin maritimum | sea-side arrow-grass |
| Trisetum cernuum | nodding trisetum |
| Vicia americana | American vetch |
| Viola sp. | violet |
| **MOSSES** | |
| Rhytidiadelphus loreus | |
| Rhytidiadelphus squarrosus | |

APPENDIX C. Definitions of habitat types

(Definitions are from Hunter et al. (1983))

INTERTIDAL

The area of tidal influence occurring between mean lower low water for large (spring) tides and mean higher high water for large (spring) tides. Higher high water can be recognized as the driftlog line and below which woody vegetation does not occur.

Bars - Surficial materials deposited and influenced by streamflow and/or marine processes. The primary process may vary from solely riverine in the upper intertidal portion of estuaries to solely marine (tidal and longshore drift) in non-intertidal areas.

Beach Face - An accumulation of unconsolidated materials within the upper intertidal zone at about the mean higher high water line for large (spring) tides of a beach. These are often ephemeral and of variable width. The beach face normally slopes gently seawards. Annual plants may colonize such areas but permanent vegetation is rarely established.

River Channel - An area composed of a bed and banks which regularly or intermittently serve to confine water in a single or multiple thread. Depth and current may vary considerably in relation to season and tide. Emergent and/or submergent vegetation may be present. River channels are formed by fluvial processes which distinguish them from tide channels.

Tide Channel - Channel resulting from and dominated by tidal processes. These drain the intertidal portion of the delta and are often characterized by silty organic bed materials and steep banks. Emergent and submergent vegetation are often present.

Flat - Low gradient intertidal components which do not support significant (15%) vascular vegetation. These are often support diverse macro and micro, drift, and attached algae. Bars and troughs may be present in some situations.

High Marsh - An intertidal marsh covered by most high tides. Some soil development and organic buildup is obvious. Such areas often exhibit a high diversity of plant species dominated by grasses and forbs. The upper portion of the high marsh may be bounded by a berm/beach face, storm ridge, shrub carr, or forest.

Low Marsh - An intertidal marsh exposed at low tides and covered at most moderate and all high tides. Such areas are characterized by: little or no soil development; low species diversity; hydrophyllic and often halophytic pioneer species; and often discontinuous cover. Commonly dominated by sedges, glasswort, sea-milkwort, and/or sea plantain.

BACKSHORE

Portion of the shore zone above the mean higher high water for large (spring) tides (i.e. above the effective level of tidal influence) where processes are predominantly riverine in nature. The sediments usually feature soil development and organic buildup. The majority of the upland areas are never inundated; however; lower areas may be inundated as a result of exceptionally high tides, tidal damming and/or freshet conditions.

Bars - Bed materials deposited by streamflow within the stream channel. These differ from intertidal bars in that riverine processes are the only operative factors.

River Channels - (see Intertidal Section)

Side Channel - Channel formed by fluvial processes and connected to the main river or stream. Current velocities and depth may vary considerably in relation to season and tide; however, the major influencing factors are riverine. Emergent and/or submergent vegetation may be present.

Forest - An area within which tree life forms 10 m or greater comprise the dominant cover. May be found on fluvial, marine, till, and bedrock/colluvial derived sites.

Shrub Carr - A periodically saturated but rarely inundated shrub-dominated area developed on mineral soils. Typical shrub species are Pacific crab apple, sweet gale, and roses.

Wildlife Working Reports should not be cited because of the preliminary nature of the data contained within.

WR-1 Progress report - coastal grizzly research project: Year 1. A.N. Hamilton. October 1984. 43pp. (Also printed as WHR-9)

WR-2 Progress report - coastal grizzly research project: Year 2. A.N. Hamilton and W.R. Archibald. October 1984. 27pp. (Also printed as WHR-10)

WR-3 Telemetry: Comments and suggestions from the coastal grizzly project 1983. A.E. Derocher. October 1984. 14pp. (Also printed as WHR-11)

WR-4 Habitat types of the Kimsquit River estuary. C. Clement. October 1984. 27pp. (Also printed as WHR-12)

WR-5 Biogeoclimatic units and ecosystem associations of the Kimsquit drainage. C. Clement. October 1984. 89pp. (Also printed as WHR-13)

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